D0 DAQ Backend Tutorial

- Data flow
- Control path
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- Buffer disks
- Config & log files
- Start up & stop
- Monitoring
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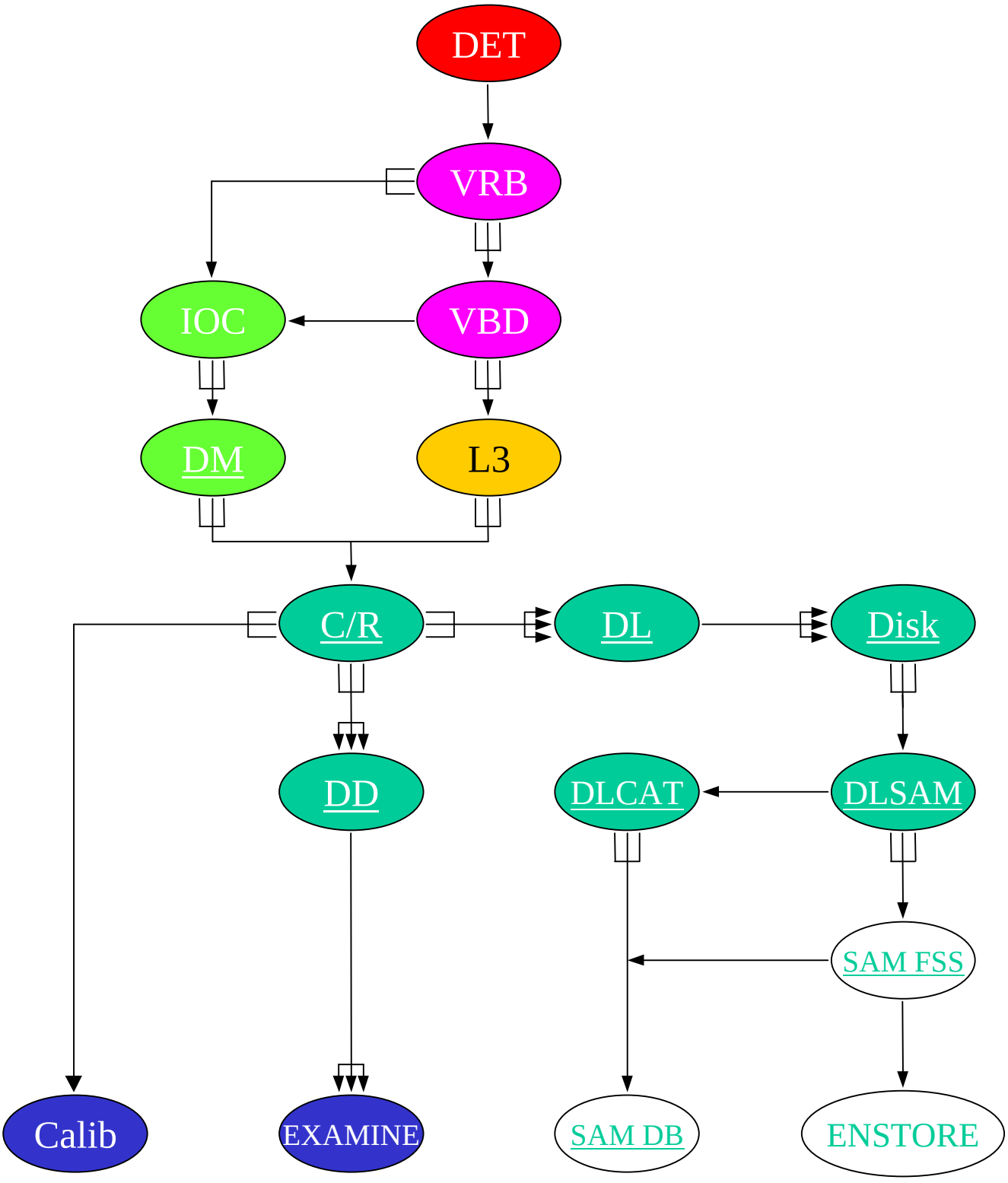
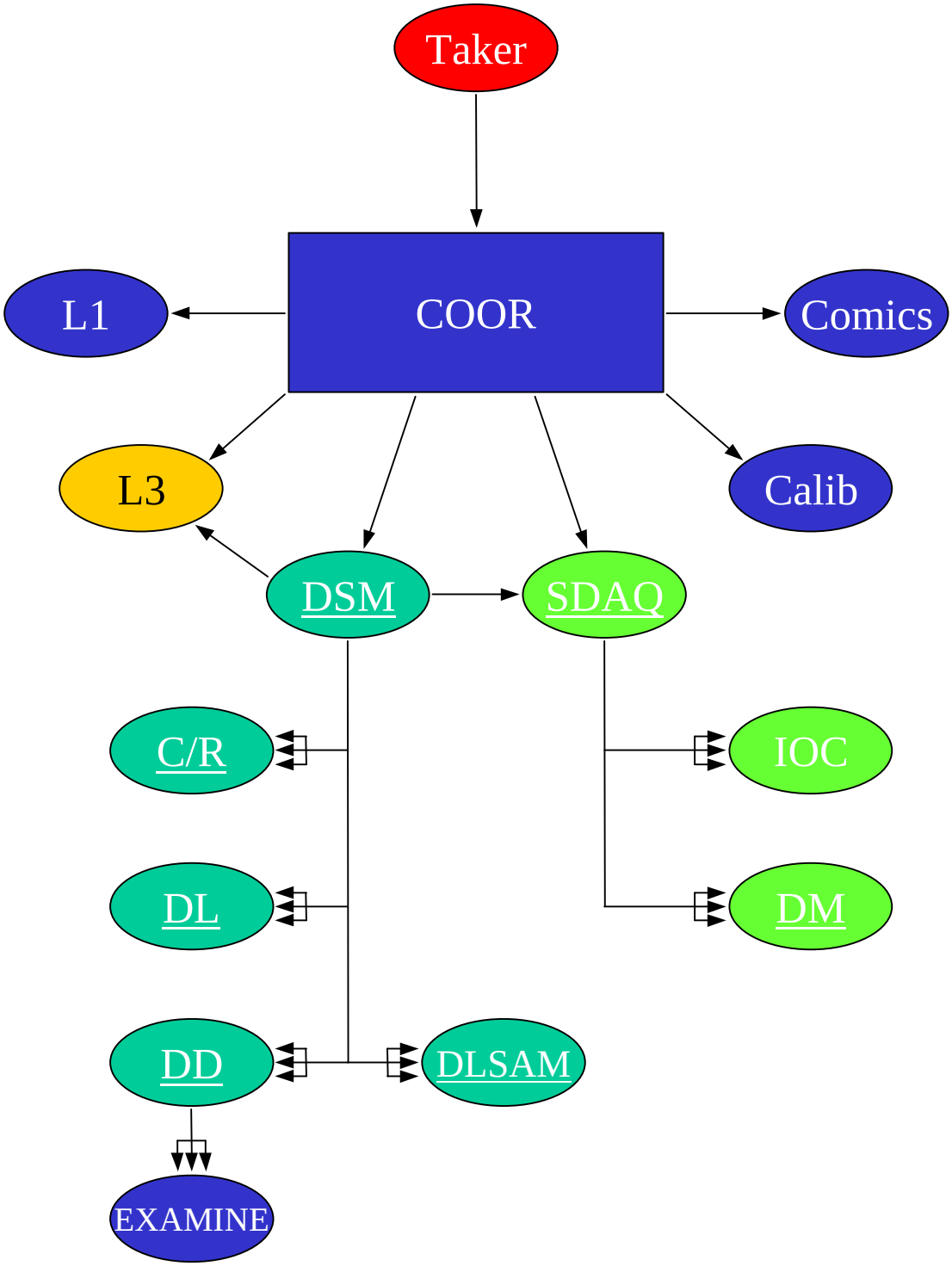
Data Flow


DET
VRB
IOC
VBD
DM
L3
C/R
DL
Disk
DD
DLCAT
DLSAM
SAM FSS
Calib
EXAMINE
SAM DB
ENSTORE

Control Path



Computer Domains

- PPC / m68k

  host IOC code, acquire data from VBD or from the VRBs directly, process, then transfer via Ethernet to DM on d0olc.

- Windows NT / Linux farm

  host L3 filtering code, acquire data from VBDs via the data cable, process, then transfer via private VLAN and Gbit interface to C/R on d0olc.

- OSF1 – d0olc(b, a)

  host COOR, DSM, DM, C/R, DL, DD, DLSAM, DLCAT, the online DBs and the SAM FSSs and stagers, manage the online buffer disks.

- Linux – d0ol01, …

  host the Taker, SdaqSuper, CalibManager and EXAMINEs (also Coor_Mon, Daq_Monitor and SES).

- Solaris / Linux

  host the SAM DB and ENSTORE servers.

Buffer disks

At present, 28 disks, /buffer/buf000-028, each 70 GB (except buf028, which is currently 140 GB).

(Buf022 is the work area for DLSAM & DLCAT.)

Can accommodate about 2 days of continuous data taking at 12 MB/s.

Config & log files

- /online/data/datapath/d0olc/*app*.setup

  for DSM, C/R, DD, DL, DLSAM and DLCAT configurations, where *app* is the application's name or acronym in lower case.

- /online/log/"acronym in lower case"/200y/mm

  for all log files. Here 200y is the 4-digit year, mm the 2-digit month.

  Occasionally if an application did not start properly, some trace information may be found in the standard output file:

  /online/log/"acronym in lower case"/out.X

  Here X is a time stamp like 20010524-082557CDT.

Start up & stop

Before attempting to start or stop an application, always check to see whether it is already/still running by:
ps –u d0run | grep *app*
where *app* can be:
dsm/collector/datalogger/distributor/dlsam/dlcat/sdaq.

- Re-start an application
  Log into the "d0run" account on d0olc, then:
  1. setup d0online
  2. start_daq *app*

  where *app* is the name -- as listed above -- or acronym of the application in lower case.

- Stop an application
  Log into the "d0run" account on d0olc, then:
  1. setup d0online
  2. stop_daq *app*

  where *app* is again the name or acronym of the application.

Please note that the essence of some of the start_daq and stop_daq commands runs in the background and may print messages to the screen. Please allow 3 to 5 minutes for the commands to finish. In the mean time, try:
ps –u d0run | grep *app*
(every 10 to 30 seconds) to monitor the progress.

Monitoring

The status of the ODS applications in the D0 DAQ chain can be checked on the web:

http://www-d0online.fnal.gov/www/daq/operations/status/onlstatus-auto.html

This page is automatically refreshed every minute. Shown on the next page is a capture of this page. It consists of six parts:

- DSM status snapshot and dump

  This part shows the last 10 relevant lines of the DSM log file in a simplified format. It gives a glance of the current status of the communications with COOR, and with the CR, DL and DD, including some details about the runs which are active (like how many events have been accumulated, the average event rate etc.).

  By clicking on the status dump link, one can see details about the DSM configuration, status of the required slaves, connectivities with the slaves, which streams are routed to which DL and the active COOR commands.

  When COOR reports trouble with “dsmdnl”, probably one of the DSM slaves (C/R, DL, DD and DLSAM) is not responding to COOR commands. The culprit can usually be found by checking the time delay between “sent to” and “reply” from a certain application.

  If one application does have some trouble, restarting it will usually solve the problem. In this case, please be sure to stop all on-going runs.

Monitoring (con't)

- DLSAM status snapshot and dump

  This part presents statistics info from DLSAM. Problems can usually be detected by monitoring the time variations of the various "Files". If the "Submitted" number remains large for a long time (like half an hour), there usually is some problem with either ENSTORE or SAM. The status of ENSTORE can be checked on:
  http://www-d0en.fnal.gov/enstore/enstore_status.html
  usually with the "Enstore System Summary", "Enstore System Status" and "encp History" subpages.

  The status of SAM (FSS in particular) can be checked with:
  setup d0online
  sam dump fss

  Please contact the helpdesk or the appropriate SAM/ENSTORE experts if the situation is not clear. Once the system is back (like ENSTORE resumes working, or the Name Service comes back), the DAQ chain can usually recover – may take a few hours. In case of emergency, call an expert.

  If the "Alarm" number is large, there must have been some persistent problem with either ENSTORE or SAM. In this case, please contact the helpdesk or the appropriate experts to ensure that the problem is solved.

Monitoring (con't)

By clicking on the "submitted" link, one can check which files are in the "submitted" state. If some files were created a long time ago (much more than one hour), there might have been some problem. In this case, one should contact the helpdesk or the appropriate experts and make sure that the problem is solved, then the system will recover by itself – may take 6 to 8 hours depending on the FSS's timeout settings.

- Recent transfers

  This part lists the times, file names and destinations of the 10 most recent successful transfers within the last 10k lines of the DLSAM log file.

- Logfile snapshot and dump

  This part presents links to log file snapshots (the most recent 100 lines) and histories (1k – 10k lines). Please note that if there are multiple instances of the same application running, the links will point to the one which was started most recently.

- Last N transfers

  This part presents links to summaries about the last N transfers.

- Link to "Trouble shooting instructions"

  This is a link to instructions paraphrased by this document.

Monitoring (con't)

The status of the SAM DbServer and the CORBA Name Service can be checked on:
http://d0db.fnal.gov/sam/diagnostics.html

If the DbServer or Name Service goes down then comes back, the FSS will re-register within one hour. If one needs to recover as soon as possible, or wants to be sure of the recovery, call a SAM or DAQ expert.

At the moment DLSAM and DLCAT cannot recover from a Name Service bounce due to some fnorb problems. They will need to be restarted after the FSS has re-registered – sam dump fss works. Until a solution is found which does not require a restart, experts should be called.

Useful commands

- Setup the environment
  setup d0online

- Check the FSS status
  sam dump fss

- Check the storing status of one file
  sam get file store status *file-name*

  This command is only useful when the file is actually being tried. When the store has finished, it will return some warning like “file not found”.

- Check the locations of one file
  sam locate *file-name*